Formal and Informal Control as Complement or Substitute? The Role of the Task Environment

Markus Kreutzer
Department of Management and Economics, EBS University, 65375 Oestrich-Winkel, Germany, markus.kreutzer@ebs.edu

Laura B. Cardinal
Darla Moore School of Business, University of South Carolina, Columbia, South Carolina 29208, laura.cardinal@moore.sc.edu

Jorge Walter
Department of Strategic Management and Public Policy, School of Business, The George Washington University, Washington, DC 20052, jorgew@gwu.edu

Christoph Lechner
Institute of Management, University of St. Gallen, 9000 St. Gallen, Switzerland, christoph.lechner@unisg.ch

The traditional view of control in organizations largely implies an "either-or" substitution logic, as opposed to the complementarity logic implied in the more recent view of control. This study examines whether formal and informal controls complement or substitute each other in their influence on performance outcomes, and whether such an interaction differs for more or less exploratory tasks. Our findings from an analysis of 184 strategic initiative teams in a cross-industry multicountry sample of firms support the complementary view. More specifically, we find support for our hypotheses that the combined use of formal and informal control has a positive impact on the performance of initiative teams, and that this complementary effect is more pronounced when the degree of exploration is lower. Accordingly, our study contributes to the organizational control literature both theoretically—by providing an explicit theoretical rationale for the complementary view—and empirically—by virtue of providing an empirical test of the interactive effects of formal and informal control.

Keywords: control theory; informal organizational control; complementarity; strategic initiative teams; degree of exploration

Organizational control is one of management's most fundamental and pervasive challenges (e.g., Van Maanen and Barley 1984). Defined as the mechanisms "through which managers seek to align employee capabilities, activities, and performance with organizational goals and aspirations" (Sitkin et al. 2010, p. 3), organizational control is seen as a critical success factor for various organizational tasks, such as human resource management (e.g., Arthur 1994) and research and development (e.g., Bonner et al. 2002, Cardinal 2001, Turner and Makhija 2006). There are two main theoretical views on organizational control. The traditional view—rooted in organization and agency theory—distinguishes between three types of control: formal behavior control (direct, personal surveillance of behavior), formal outcome control (focused on the results of employees' behavior), and informal clan control (built on selection and socialization processes to eliminate goal incongruence between employees and the larger organization) (e.g., Eisenhardt 1985; Ouchi 1977, 1979; Ouchi and Maguire 1975). This view maintains that depending on the task context, *either* formal control (of behavior and/or outcomes) *or* informal control is the most appropriate. Thus, with few exceptions (e.g., Baker et al. 1999, 2002), the traditional view of control assumes a substitution logic (Ouchi and Maguire 1975, Thompson 1967), implying that the marginal benefits of one type of control decrease with increasing levels of the other (cf. Siggelkow 2002).

The more recent complementary view, on the other hand, emphasizes the advantages of a complementary use of formal and informal types of control (Cardinal et al. 2004, 2010; Long et al. 2002; Turner and Makhija 2006). This view asserts that the marginal benefits of one type of control increase with increasing levels of the other (cf. Siggelkow 2002). Such a complementary control approach is promising, compared to the traditional focus on a single control type, as the latter likely does "not provide a complete understanding of control in complex, dynamic, and uncertain organizational environments" (Kirsch and Choudhury 2010, p. 302).

Neither the traditional nor the more recent view, however, has explicitly theorized or empirically tested the question of whether formal and informal controls

substitute or complement each other. In this study, we therefore investigate whether formal and informal controls act as substitutes or complements for each other in their influence on performance outcomes. We synthesize competing arguments and empirically test the relationship between formal and informal control in the context of strategic initiative teams. Strategic initiatives are temporary, coordinated undertakings for renewing or expanding the capabilities of an organization that may substantially impact its evolution and performance (Lechner and Kreutzer 2011), and have become a focal point in the field of strategic management (Lechner and Floyd 2012, Nag et al. 2007). Organizations increasingly rely on strategic initiative teams to address the current complex, uncertain, and dynamic work environment (Kirsch and Choudhury 2010), with strategic initiative teams often exploring new and uncharted territory (Lechner et al. 2010, Walter et al. 2016). Moreover, strategic initiative teams are characterized by temporal and organizational boundaries, which makes them easily identifiable and empirically observable (Lovas and Ghoshal 2000). For these reasons, strategic initiative teams provide an ideal context for our study of the effects of combinations of formal and informal organizational control.

To refine our framework, we also examine a potential boundary condition for the interaction of formal and informal control. Prior work suggests that the task environment—and more specifically, the level of uncertainty that characterizes processes and goals—represents an important contextual factor in the use and effectiveness of control (e.g., Eisenhardt 1985, Ouchi 1977). In particular, prior work has asserted that "informal controls can supplement or augment formal controls, particularly when tasks are novel or highly uncertain" (Kirsch et al. 2010, p. 472), but has not yet provided any theoretical or empirical support for this assertion. We therefore theorize and test whether and to what extent the performance effects of the joint use of formal and informal controls are affected by strategic initiative teams' degree of exploration, or the degree to which the controlled tasks draw on existing internal knowledge (lower exploration) versus knowledge that is new to the firm (higher exploration) (Gupta et al. 2006, Lechner et al. 2010). Our focus on the degree of exploration reflects the paramount importance of this contingency factor in the strategic initiative literature (e.g., Bonner et al. 2002, Burgers et al. 2008, Gupta et al. 2006, Lechner et al. 2010, McGrath 2001) and allows us to take into account the level of uncertainty that characterizes processes and goals, which has been identified as an important contextual factor in the use and effectiveness of organizational control (e.g., Eisenhardt 1985, Ouchi 1977).

Our study offers the chance to resolve the conflicting assumptions of how different control types interact in their influence on performance outcomes. We develop and test novel theorizing leading to refined assumptions that can move control theory forward and give managers a way to avoid costly misperceptions regarding interactions between control types (cf. Siggelkow 2002). Our study also contributes to a better understanding of informal organizational controls, which have received less attention in the control literature, particularly in empirical research (for a few notable exceptions, see Kirsch et al. 2010, Long et al. 2011). Our rudimentary understanding of this phenomenon is problematic as recent studies cautioned that formal controls—relying on prespecified rules, performance objectives, and hierarchical relationships—are losing their effectiveness in an increasingly team-oriented, knowledge-intensive work environment (Hagel et al. 2010, Kirsch and Choudhury 2010, Kirsch et al. 2010). As a consequence, informal controls may represent a viable and important complement to (or substitute for) formal controls. This study is a first step toward advancing our understanding of this important phenomenon.

Theory and Hypotheses

Following a recent resurgence of research interest in organizational control, two views on control have emerged, with often conflicting assumptions regarding the joint effects of formal and informal organizational controls. In the following, we provide a synthesis of both views before developing our hypotheses on the interactive effects of formal and informal controls on the performance of strategic initiative teams, as well as the moderating influence of the degree of exploration characterizing a strategic initiative.

Formal and Informal Control as Substitutes

Following Ouchi's (1977, 1979) seminal studies, the traditional view of organizational control has distinguished between formal behavior control (specifying explicit procedures that must be followed, including monitoring ongoing activities), formal outcome control (focusing on results rather than the means of achieving outcomes), and informal clan control (designing appropriate selection and socialization mechanisms that help establish and maintain norms, values, and culture) (Eisenhardt 1985). In addition to informal control as clan control, more recent work has further differentiated the same control targets as the literature on formal control, i.e., informal behavior control and informal outcome control (Cardinal et al. 2004, 2010). In this view, formal and informal control have in common that they are hierarchical (i.e., a controller and a controlled team are involved or are present), organizational (i.e., alignment of employee

capabilities, activities, and performance with organizational goals and aspirations is pursued), and intentional (i.e., consciously used by the controller). Whereas *formal control* refers to "officially sanctioned (usually codified) institutional mechanisms, such as written rules, standard operating systems, and procedural directives—visible, objective forms of control," *informal control* refers to "unwritten, unofficial [...], less objective, uncodified forms of control" (Cardinal et al. 2004, p. 414). In other words, formal and informal control are not the ends of a single "formality" continuum as traditional research has long suggested (e.g., Barnard 1938), but are increasingly understood as representing "distinct dimensions" of organizational control (Cardinal et al. 2010, p. 57), with visibility and explicitness being the key differentiators between formal and informal control.

In our context of strategic initiative teams, *formal behavior control* entails the establishment of explicit rules, procedures, and policies for strategic initiatives, whereas *formal outcome control* entails deadlines, goals, and cost budgets, with both relying on monitoring the extent to which teams follow procedures or achieve outcomes and whether performance evaluations take that into account. In contrast, *informal behavior control* is a noncodified but deliberate attempt by which managers influence the means to achieve desired ends (Cardinal et al. 2010). Common mechanisms include managers providing verbal feedback on day-to-day processes or organizational norms and values that guide behavior and that are transferred through managers' regular involvement and by sharing stories about prior activities. *Informal outcome control*, on the other hand, is directed at the results of behavior (Cardinal et al. 2004) and may include verbal encouragement and praise for being focused on and achieving goals as well as managers sharing experiences and stories about previous team successes and failures.

The traditional view of control would further consider formal and informal control as substitutes for each other, with one *or* the other being more appropriate depending on the tasks performed. While an explicit theoretical rationale for such a substitution effect is notably absent in the traditional control literature,[1] such an effect can be corroborated by key tenets of leadership and goal-setting theory. Regarding the former, prior work on leadership suggests that behavioral norms (i.e., informal control) may make formal control redundant and inconsequential (Kerr and

Jermier 1978). In support of this argument, empirical evidence shows that the effects of transformational leadership (informal control) and transactional leadership (formal control) on individual (Wang et al. 2011) and team performance (Judge and Piccolo 2004) are similar in magnitude, operate independently, and add little or no incremental value when combined (Stewart et al. 2012). Extrapolated to our context, this research would suggest that formal and informal controls are largely redundant and would therefore act as substitutes for each other in their influence on the performance of strategic initiative teams.

Regarding the latter, one of the key insights of goal-setting theory (Locke and Latham 1990, 2005) is that people are extrinsically motivated to increase their efforts when they are held accountable for their behaviors and/or for achieving pre-established performance standards, and when they are rewarded accordingly. At the same time, however, prior work has cautioned that an increasing extrinsic motivation is detrimental to people's intrinsic motivation (Jenkins et al. 1998). While informal and formal control are not perfectly congruent with, respectively, intrinsic and extrinsic motivations, prior organizational control work has suggested the possibility of a parallel crowding-out effect. Specifically, "legalistic remedies can erode the interpersonal foundations of a relationship they are intended to bolster because they replace reliance on an individual's 'good will' with objective, formal requirements" (Sitkin and Roth 1993, p. 367). Following this logic, any positive effect of informal control on performance outcomes would be diminished when informal control is supplemented with formal control. Extrapolating the traditional view on organizational control to our context of strategic initiative teams would thus suggest a substitution effect between formal and informal controls on initiative team performance.

Formal and Informal Control as Complements
In spite of the theoretical appeal of the traditional view, prior work has anecdotally observed informal controls to appear in tandem with formal controls (Cardinal et al. 2004, 2010; Kreutzer and Lechner 2010). Since its origins in 1895, Lincoln Electric, for example, has combined elements of formal and informal controls in its four core human resource management practices: piecework pay (i.e., wages were based solely on the number of pieces employees produced), discretionary bonus, merit rating, and an employee advisory board (Siegel 2008). More importantly, some of these studies have proposed that there are benefits when organizations combine formal and informal control, which would imply a complementary relationship (Cardinal

---

[1] In his study, Ouchi (1979, p. 846) instead talks about the efficiency with which controls can operate and identifies "two underlying issues which are of central importance in determining which form of control will be more efficient [...] the clarity with which performance can be assessed [...and] the degree of goal incongruence."

et al. 2010).[2] In the case of Lincoln Electric, the creation over time of a unique and carefully developed incentive system not only led to remarkable productivity gains, but is also hard to replicate for competitors and arguably a key contributor to Lincoln Electric's sustainable competitive advantage (Siegel 2008).

A synthesis of the recent literature reveals that these benefits fall broadly into three categories. Applied to our context of strategic initiative teams, they are as follows. First, combining formal and informal control can *foster dialogue* between initiative team members and management (Auh and Mengue 2007). While formal behavior control specifies arenas for interaction (e.g., initiative steering committee meetings), complementing these with informal means of sharing information, experiences, and stories enhances managers' opportunities to act as brokers and boundary-spanners. This further encourages team members to access (Turner and Makhija 2006) and transfer diverse knowledge (Sorensen 2002), which supports organizational learning (Simons 1991). Positive team perceptions about the legitimacy of management's decisions arising from such informal social interactions (Sitkin and Bies 1994a) may help team members feel more connected to the managers, making them more inclined to share their opinions (Cardinal et al. 2004). This would provide management with a broader range of up-to-date information that guides timely formal interventions regarding initiative decisions (Poskela and Martinsuo 2009). Similarly, the clear goals, deadlines, and budgets of formal outcome control help alleviate uncertainties, give purpose and direction, and create team focus. Informal outcome controls, exercised by managers sharing their views on outcome goals with their team members (Turner and Makhija 2006), can complement this uncertainty reduction and increase understanding and acceptance among team members.

Second, the joint use of formal and informal control can also *foster cooperation* between initiative team members and management. As prior work in the contracting literature has demonstrated, the existence of formal agreements—which are necessarily incomplete—can facilitate the self-enforcement of informal agreements (Lazzarini et al. 2004). In particular, informal agreements tend to be stable only if the long-term payoff of cooperating with each other exceeds potential gains from short-term defecting. The incentives and/or punishments inherent in formal agreements, in turn, reduce potential gains from short-term defection, thereby increasing the value of honoring informal agreements (Poppo and Zenger 2002).

In our context of strategic initiative teams, this literature would suggest that formal controls, by enforcing those dimensions they capture contractually, facilitate the self-enforcement of nonformalized dimensions, particularly those specified by a strategic initiative's informal controls.

Third, formal and informal control each have their unique advantages and disadvantages. Their complementary use therefore offers opportunities to *mitigate limitations and deficiencies* inherent in relying on only one or the other type of control. For instance, whereas formal control provides explicit guidance (Ouchi and Maguire 1975), it is largely standardized and relatively inflexible (Burgelman 1983). Complementing formal with informal control may help alleviate this, as more flexible informal controls allow managers to approach control more "situationally" (Ocasio and Wohlgezogen 2010). Cardinal et al. (2004, pp. 425–426) longitudinal case study, for instance, showed that a focus on formal controls in the founding phase of their sample organization became "overly legalistic and punitive" and "increased animosity between [employees] and management and eventually incited the [employees] to walk out." As this example shows, team members may interpret high levels of formal behavior control as mistrust in their skills and capabilities, which undermines motivation and engagement in the initiative process (Cardinal et al. 2004, Sitkin and Bies 1994b). As a result, team members' energy may be diverted from constructive behavior to unproductive, defensive, or even dysfunctional behavior (Ramaswami 1996). In contrast, informal control's regular dialogue between managers and the initiative team members could serve as a platform to openly address misperceptions and thereby mitigate these unintended side effects.

Similarly, formal control may be able to mitigate deficiencies inherent in informal control. For instance, while allowing for more flexible and context-specific control (Ocasio and Wohlgezogen 2010), it is questionable whether informal controls alone would be incentive enough for initiative team members to fundamentally adapt their behaviors, particularly to a novel context such as strategic initiatives. Complementing informal with similarly aligned formal controls—such as behavior and performance evaluations that formally reward the behaviors emphasized by informal control as well as achieving the desired results—should enhance initiative team focus, motivation, and performance. Following this second view of organizational control, we propose Hypothesis 1.

Hypothesis 1. *Formal and informal control complement each other in their effects on the performance of strategic initiative teams, with higher degrees of informal control enhancing the positive effect of formal control, and vice versa.*

---

[2] Any positive performance effects of a complementary use of formal and informal organizational controls rest on the assumption that these controls are well-aligned, i.e., both formal and informal controls are targeted at monitoring and rewarding the same behaviors and outcomes.

Moderating Effect of the Degree of Exploration

Work as early as Blau (1955) suggests that depending on the task context, "[c]ontrol mechanisms may be substitutes for other controls, may add influence to other controls, and may at times reduce the effects of other controls [...]. That is, some control mechanisms are substitutes, complements, or replacements for one another" (Peterson 1984, p. 574). In line with this contingency view, we propose that the complementary effects of formal and informal controls on initiative team performance will be contingent on the initiative's degree of exploration, defined as the degree to which controlled tasks draw on existing internal knowledge (low exploration) versus knowledge that is new to the firm (high exploration) (Gupta et al. 2006, Lechner et al. 2010).[3]

Prior work has maintained that the positive effects of informal control are especially pronounced in tasks "with a greater level of uncertainty in process and goals" (Kirsch and Choudhury 2010, p. 302). In complex and uncertain situations, such as highly exploratory initiatives, senior managers cannot be expected to know everything (Eisenhardt and Sull 2001). Rather than getting formally involved in managing the details and anticipating the many contingencies that can arise over the course of a highly exploratory strategic initiative, the role of managers is to set simple, informal norms and goals. These informal values and outcomes can then serve as boundaries for team members to interpret what should be done, providing them with the necessary flexibility to react to unforeseen developments (Bonner et al. 2002, Simons 1994). Moreover, while initiatives with lower degrees of exploration rely on organizational knowledge that

requires little or no adaptation, exploratory initiatives are characterized by a high degree of equivocality (Daft and Lengel 1986) that requires extensive search, iterations, entrepreneurial learning, and flexibility (Poskela and Martinsuo 2009). Informal controls are not only more conducive to transferring tacit, sticky knowledge without restricting individual discretion and creativity (Turner and Makhija 2006), but their ability to be more dynamic and responsive to unpredictable situations makes them more beneficial for exploratory initiatives (Bonner et al. 2002, Simons 1994).

In contrast, formally specified procedures, rules, and outcomes—as well as their associated benefits of alleviating uncertainty by providing purpose and direction and creating team focus as outlined earlier—are less effective in more novel and uncertain situations where it is much more difficult to anticipate and specify procedures, rules, and outcomes ex ante. High degrees of novelty and uncertainty also reduce the dimensions formal controls can contractually capture and therefore diminish their ability to facilitate the self-enforcement of informal controls (Lazzarini et al. 2004). More importantly, formal controls tend to constrain important sources of variation generated by team members' autonomous behavior (Burgelman 1983) and can have a negative effect on experimentation and risk-taking (Jenkins et al. 1998), needed for more exploratory activities. Initiative teams may opt for existing markets or reliable technical solutions rather than risky innovative options that will benefit the organization in the longer run (Poskela and Martinsuo 2009) as they may worry that they will be penalized for failures that naturally accompany risk-taking (Jackson et al. 1989). And last, initiative team members may interpret formal controls as bureaucratic and overly legalistic (Ramaswami 1996), with the potential to dominate organizational attention, slow down or bias decision-making, and produce sub-par outcomes (Sitkin and Bies 1994b). This is especially problematic in exploratory tasks that require novel ideas, open-mindedness, and flexibility.

In line with these arguments, empirical evidence shows that formal controls have a negative effect on the performance of R&D initiatives when the number of exceptions is high (Abernethy and Brownell 1997) and in more innovative and uncertain initiatives (Bonner et al. 2002). Goal and supervisory autonomy, on the other hand, have a positive influence on performance outcomes in exploratory business development initiatives (McGrath 2001). As a result, aligning initiative control with the degree of exploration being pursued is deemed critical for successfully managing strategic initiatives (Burgers et al. 2008).

In sum, this diverse set of studies on organizational control in highly exploratory settings suggests that such a context seems to favor informal over formal controls. Given the more pronounced negative effects

---

[3] The degree of exploration—or the degree to which the controlled tasks draw on existing knowledge (lower exploration) versus knowledge that is new to the firm (higher exploration) (Gupta et al. 2006, Lechner et al. 2010, McGrath 2001)—is not identical to the organizational control literature's focus on task programmability—or the knowledge of the transformation process—and outcome measurability (e.g., Eisenhardt 1985; Ouchi 1977, 1979; Thompson 1967). It is evident from these definitions, however, that a key attribute shared by control and exploration scholars alike is uncertainty: the more uncertain or novel a strategic initiative is, the more difficult it will be to adequately judge the associated processes and behaviors, and appropriately measure outcomes. In other words, we see the ideas of observability and measurability as partially overlapping, with one caveat—the degree of exploration serves as a broader concept than what was proposed in the control literature when observability and measurability were introduced by Thompson (1967) in the 1960s and adopted by Ouchi (1977, 1979) in the 1970s. With the focus on industrial work at that time, discussions around observability and measurability were significantly less focused on the novelty of knowledge, which has become the focus of control scholars analyzing increasingly team-oriented, knowledge-intensive work environments (Hagel et al. 2010, Kirsch and Choudhury 2010, Kirsch et al. 2010). In line with this more recent focus, we have thus chosen the degree of exploration as our key contingency.

of formal controls in highly exploratory initiatives, and the similarly enhanced positive effects of informal controls, we therefore expect the advantages of a complementary use of formal and informal controls—i.e., fostering dialogue and cooperation and, particularly, formal control mitigating deficiencies in informal control—to be diminished in its influence on the performance of strategic initiative teams. Formally:

HYPOTHESIS 2. *There is a three-way interaction between formal control, informal control, and the degree of exploration characterizing a strategic initiative on initiative team performance: the complementary effect of formal and informal control on initiative performance is diminished for higher degrees of exploration.*

Methods

Data and Sample
This study is part of a larger research project on organizational control and strategic initiative teams (Kreutzer et al. 2015). After conducting more than 50 interviews with leading firms around the globe (e.g., ABB, Dell, eBay, E.ON, Intel, Microsoft, UBS) to develop a qualitative understanding of organizational control in the context of strategic initiatives, we used the Schober database[4] to select a sample population of 1,215 firms that met four criteria: They operated in central and western European countries (Germany, Austria, or Switzerland); were part of the manufacturing, utility, banking, consulting, high tech, or insurance industries; employed at least 10 full-time employees; and generated a minimum revenue of 10 million euro.

We further engaged six management scholars to critique preliminary versions of our eight-page questionnaire. Once they had confirmed face validity, we asked seven executives to pretest the questionnaire based on their experience managing strategic initiatives. They could choose either the English or German version of the survey; the German version was created through back-translation of the English one.

We focused on strategic growth initiatives to represent the broader context of strategic initiatives for two reasons. First, although all strategic initiatives share the same basic features—their temporary but coordinated nature as well as their ultimate focus on renewing or expanding organizational capabilities—there is at least some degree of heterogeneity across initiatives, such as their focus on growing revenues, reducing costs, enhancing quality, and focus on customers (Kreutzer and Lechner 2010, Lechner and Kreutzer 2011), suggesting that either controlling for or a focus

on only one type of strategic initiative was warranted. At the time of our survey, there was a widespread focus among our sample companies on growing their business, and thus an increased likelihood of companies we contacted actually pursuing growth initiatives. In fact, 51.93% of our sample firms' past strategic behavior was focused on growth-related issues; the second most important focus was cost considerations with 26.4%. Our focus on growth initiatives therefore allowed us to control for any heterogeneity regarding initiative type, but also capture the most common type of strategic initiatives within our sample firms. Second, in contrast to cost or efficiency initiatives, which tend to be less exploratory (Kreutzer and Lechner 2010), growth initiatives exhibit a range of exploration from low (e.g., core growth initiatives) to high (e.g., growth outside the core initiatives), allowing for variance with respect to our key contingency variable.

We asked informants to focus on evaluating their firms' growth initiatives (Kreutzer and Lechner 2010) by specifying: "These undertakings cover a wide range from growing the core business to new product development, entry into new markets, etc. At the corporate level, these growth initiatives are coordinated undertakings in order to build new or renew existing sources of revenues and profit. Sometimes they even cut across business units (regions, products, or customers) or are beyond the scope of a single unit." This prompt clearly reflects our theoretical focus on strategic initiatives, which is geared toward renewing or expanding the capabilities of an organization to substantially impact its evolution and performance (Lechner and Kreutzer 2011).

After finalizing the questionnaire, we sent each company's senior executive a survey package containing a cover letter explaining our study, response instructions, two copies of the questionnaire, a URL to the same survey, and prepaid return envelopes. We asked them to complete one copy of the questionnaire and forward the second copy to another senior executive whose knowledge of the business and involvement in the firm's strategic initiatives would make him or her an appropriate secondary respondent. We offered the respondents a summary of our study's results, and assured them that their responses were confidential (Miller et al. 1997). Executives who did not respond within three weeks received a personal email explaining the survey, with a link to the web-based survey and a copy of the questionnaire attached. Extensive follow-up faxes and phone calls to nonrespondents came next, followed by second and third email reminders five and seven weeks after the initial mailing. Eventually, 24 firms proved unreachable (owing to undisclosed location changes, cessation of business, and so on), reducing the original population to 1,191 firms. From this pool, we received responses from 284 firms, of

---

[4] Schober (http://www.schober.de/en/data/business-lists.html) is the most comprehensive business-to-business marketing database on the European market and is frequently used for European company addresses.

which 200 returned the completed questionnaire. The remaining 84 firms replied that they were not pursuing any growth initiatives, so we were left with a response rate of 24%, which compares favorably with recent work on top executives (Simsek et al. 2010) and with commonly reported response rates for such surveys (Hambrick et al. 1993). Our response rate is conservative in that we were unable to tell, based on Schober listings, which firms had recently completed or were actively engaged in strategic growth initiatives.[5] A final cull of 16 firms with missing values left us with a usable sample of 184 firms.

For second respondents, follow-ups yielded information from managers in 91 of 184 sample firms. The information from these 91 second respondents, who completed the questionnaire independent of the first respondents, was used to test for reliability and robustness tests, as well as to help assess the potential for common-method bias.

We used two tests to investigate the potential for nonresponse bias. We compared respondent firms to nonrespondents in terms of size and industry, and found no significant industry differences, but that responding firms were slightly larger than nonrespondents. Moreover, responses from questionnaires returned earlier showed no significant difference from post-follow-up responses, which also suggests that our results are unlikely to be subject to nonresponse bias (Armstrong and Overton 1977).

The 184 responding firms averaged 5,657 employees and had average revenues of 2.4 billion euros. More than half (57%) of the responders were headquartered in Germany, 26% in Switzerland, and 17% in Austria. Concerning industry, 11% of responding firms operate in manufacturing, 11% in utilities, 28% in banking, 14% in consulting, 19% in high technology, and 15% in insurance. On six of the surveys, the firms classified themselves as "other industry"; therefore the percentages for the sample's industry distribution do not add up to 100%. The results remained the same, however, with and without the inclusion of these six firms. All respondents were actively involved in managing growth initiative teams. Most respondents were CEOs (47%) or held a senior executive position such as CFO (34%); a smaller portion managed growth initiative teams at the second hierarchical level (19%).

[5] It is reasonable to assume that a proportion of the nonrespondents were not pursuing growth initiatives in their organization and therefore did not answer at all. A disproportionate percentage of nonrespondents might have used that as a reason for their nonresponse, which would lower our firm population and increase our response rate. If we extrapolate from the 84 firms of the 284 that responded, 30% were not pursuing growth initiatives. It is therefore possible then that only 70% or 834 of the 1,191 firms were pursuing such initiatives.

Measures

Dependent Variable. To evaluate initiative team performance, we adapted a 10-item measure from prior research (Lechner et al. 2010, McGrath 2001), in which items reflected the extent to which a number of goals and objectives were achieved according to a seven-point scale, from 1 denoting "very unsuccessful" to 7 denoting "very successful" (see appendix for all survey items). We added "meeting revenue parameters" to the original 10 items to adapt the construct to our context (the results remain the same, with and without this item). The resulting 11-item scale had an alpha of 0.88. Only 57% of the strategic initiative teams in our sample were rated as successful (i.e., above 4), supporting results from prior studies (Saunders et al. 2008), and suggesting that our sample is not overly biased toward successful initiative teams.

Independent Variables. For each independent variable, respondents answered the following question: "To what extent do you agree/disagree with the following statements?" (1 = strongly disagree; 7 = strongly agree). We used the past tense in the wording of all independent variables to mitigate causality problems (Miller et al. 1997). Multi-item scales and factor analyses including all independent variables with varimax rotation allowed us to examine the dimensionality of measures and the appropriateness of items (using oblique rotation instead delivered the same results). Items were eliminated when necessary to improve the internal consistency of the scales or were adjusted to align with our research context.

For *formal control*, we used Kreutzer et al.'s (2015) validated seven-item scale, which includes both formal behavior control and formal outcome control, and which has a Cronbach alpha of 0.84 (see appendix for all items). In line with Kreutzer et al. (2015), however, these seven items load on two factors, clearly separating formal behavior control (alpha of 0.77) from formal outcome control (alpha of 0.86).

To capture *informal control*, the lack of a validated scale made it necessary for us to develop new items. Following the American Psychological Association's (1985) guidelines, we conducted a literature review and more than 50 qualitative interviews with executives from leading firms around the globe (e.g., ABB, Dell, eBay, E.ON, Intel, Microsoft, UBS), before developing definitions for informal control. We then inductively and deductively generated six items that defined the content of this construct to ensure content validity. This process resulted in three *informal behavior control* items that assessed the extent to which initiative teams received ongoing informal feedback, top management shared stories about successes and failures, and top management got involved with initiative teams. As the last item had a high cross-loading with formal

behavior control items, we retained only the first two items. For *informal outcome control*, we generated three items that assessed the extent to which initiative teams received verbal praise for good results, top management encouraged initiative teams to reach their goals, and top management informally shared their views on goal attainment with their initiative team managers. As the last item cross-loaded with formal behavior control items, we retained only the other two. The four informal control items together have an alpha of 0.75. Similar to our formal control items, however, informal behavior control and informal outcome control items loaded on two different factors with alphas of 0.69 and 0.82, respectively.

We further assessed the validity of our organizational control variables by examining whether our variables showed better fit with the hypothesized two-factor solution (i.e., with behavior controls and outcome controls subsumed under two latent constructs: formal control and informal control), or with a four-factor solution (i.e., with formal behavior control, informal behavior control, formal outcome control, and informal outcome control). Compared to the two-factor solution (IFI $= 0.79$, CFI $= 0.79$, and RMSEA $= 0.15$), the four-factor solution was clearly superior, exhibiting good fit (IFI $= 0.96$, CFI $= 0.96$, and RMSEA $= 0.08$) and meeting all thresholds (IFI > 0.90 (Bollen and Long 1993), CFI > 0.90 (Bollen and Long 1993), RSMEA > 0.08 (Hu and Bentler 1995, Mulaik et al. 1989)). A chi-square difference test also indicated that the four-factor solution exhibited superior fit.[6] These findings indicate high convergent and discriminant validity of our constructs, but also suggest that the four-factor solution better fits our data. As a consequence, we supplement our presentation of the results for the hypothesized two-factor model (Table 2) with the more nuanced interactions between formal and informal behavior control, and between formal and informal outcome control (Table 3).

For *degree of exploration*, we used McGrath's (2001) nine-item measure. A principal component analysis found two items (the people who are working on the growth initiative and the know-how and skills of the initiative team) that cross-loaded on other variables and were therefore eliminated. The remaining items loaded onto two factors: the first factor includes four items (alpha $= 0.74$) oriented externally toward new markets and customers; the second factor includes three items (alpha $= 0.66$) oriented internally toward

new products incorporating technology. This distinction resonates closely with the new product development literature's well-established distinction between customer and technology exploration (e.g., Danneels 2002). We therefore complement our report of the results with exploration as an aggregate construct (alpha of 0.76, Table 2, Models 1–4) with a report of the results distinguishing the two exploration types (Table 2, Model 5a and 5b).

Control Variables. We included several firm-level control variables in our analysis (see appendix for all items). In line with prior work, we included all control and independent variables reported in Kreutzer et al. (2015) to examine our results over and above the variables prior work has found to be influential in this context. In particular, we controlled for *industry* and *country* because differences with respect to technological or market uncertainty may influence initiative team performance (Lechner et al. 2010). We used *firm size* (measured as the log of the number of employees) to account for possible better performance of growth initiative teams in small companies, where initiative teams may have fewer initiatives to compete with and will likely get more support from top management (Lechner et al. 2010). A fourth control, *past performance*, was measured through a self-reported assessment of sales and earnings before interest and taxes (EBIT) performance three years prior to the survey and relative to competitors (alpha $= 0.82$). We also controlled for *growth experience*, operationalized as a dummy variable with a value of 1 if the percentage of growth initiatives in a firm's past portfolio of strategic initiatives was at least 25%, as well as for *impact duration*, defined as the length of time until earnings reflect the impact of an initiative. As prior work has provided evidence for the pervasive influence of organizational politics in strategic initiative teams (Kreutzer et al. 2015), we also controlled for both *managerial politics* and *group politics*. Lastly, we also controlled for *formal input control*, which comprises the search for and selection of people who fit an initiative team's needs as well as training and developing the initiative team before they assume responsibility (Cardinal et al. 2004). We measured this control variable with three items used in Kreutzer et al. (2015). *Informal input control* was measured with a newly-developed one-item measure.[7]

---

[6] We also tested another way of subsuming the control items under two latent constructs—one for each control target, i.e., behavior control versus outcome control. This alternative two-factor solution, however, yielded a worse fit (IFI $= 0.77$, CFI $= 0.77$, and RMSEA $= 0.16$) than the proposed four-factor solution as did another permutation for a one-factor solution (combining all four control types as "control"; IFI $= 0.66$, CFI $= 0.65$, RMSEA $= 0.19$).

[7] In addition, we checked whether the inclusion of other potentially relevant control variables changed our results. We controlled for *organizational slack* measured with three items based on Chattopadhyay et al. (2001) with a Cronbach's alpha of 0.81, for *firm innovativeness* measured with three items used by Maydeu-Olivares and Lado (2003), and for the *number of growth initiative teams* in a firm, measured as the logarithm of the absolute number of ongoing undertakings. All these controls did not change our results, were themselves insignificant, and therefore excluded from the final

Validity and Reliability

To mitigate a possible common method bias, we followed recommendations for ex ante survey design choices, such as protecting respondents' anonymity, separating the items for independent and dependent variables, and placing items for the dependent variable below the other items to mitigate social desirability and consistency biases (Podsakoff et al. 2003, 2012). Moreover, our hypothesized moderator effects are less vulnerable to common method bias than main effects: based on a series of Monte Carlo simulations, Siemsen et al. (2010) demonstrated that the likelihood of obtaining statistically significant moderator effects is actually reduced to the extent that a common method effect is present. Consequently, "if a study is designed to test hypotheses about quadratic or interaction effects, rather than main effects, then method bias would not be able to account for any statistically significant effects observed" (Podsakoff et al. 2012, pp. 564–565).

To investigate any remaining common method bias, we used the latent variable approach Podsakoff and colleagues suggested (2003, 2012). We conducted a confirmatory factor analysis in which we added an uncorrelated common method factor to the overall measurement model. All measured items for the four types of organizational control, the degree of exploration, and initiative team performance were allowed to load on their associated theoretical constructs and on the common method factor. This allowed us to estimate the percentage of variance in responses due to trait, method, and random error components (Williams et al. 1989). Partitioning the variance this way revealed that 46% of the variance was accounted for by the six trait factors, 50% by random errors, and only 4% by the method factor. Not only is the proportion of the variance accounted for by the method factor much less than that explained by the trait factors, but the percentage of variance due to the method factor was much less than the percentages typically found in other studies: Williams et al. (1989) reported an average of 25% common method variance across the studies they analyzed; and Podsakoff et al. (2003) reported an average of 24% across a large number of studies they examined. Thus, any potential bias is likely to be minor and unlikely to affect our results.

Data from our 91 second respondents helped address any remaining concerns about common method bias. In a first analysis, we aggregated all available data from first and second respondents[8] and re-ran

each model reported here by calculating the mean score for each item between first and second respondent. All hypothesized results remained the same. In a second analysis, we replaced the dependent variable, if available, with the dependent variable assessments provided by second respondents, and re-ran our regression analyses. Again, our hypothesized results remained unchanged. In a final analysis, we conducted paired *t*-tests to compare the means of all control, independent, and dependent variables between single-respondent firms versus two-respondent firms in our sample. All *t*-tests were nonsignificant, suggesting that there was no statistically significant difference between our single- and two-respondent firms. These additional analyses suggest that our results are unlikely to be affected by common method bias.

Analyses

To test our hypotheses, we standardized the predictor variables before multiplying them to create interaction terms (Aiken and West 1991). To further interpret the hypothesized two- and three-way interactions, we plotted the results (Aiken and West 1991, Cardinal et al. 2011) and tested the simple slopes of the regression lines corresponding to all possible combinations of low (one standard deviation below the mean) and high (one standard deviation above the mean) levels of control with the degree of exploration. As previously indicated, we present the results for our hypothesized model in Table 2, and the more nuanced results incorporating the distinction between behavior and outcome control for both formal and informal control in Table 3.

Results

Table 1 presents descriptives and correlations. No bivariate correlation between independent variables was above 0.48, and the largest variance inflation factor, which was associated with the three-way interaction term between formal/informal behavior control and exploration in Model 8, was 2.69, well below the common threshold of 10 (Hair et al. 2009). This suggests that multicollinearity was not a concern in our analysis.

---

analysis. Similarly insignificant results were obtained for initiative-level control variables such as *initiative size*, measured in terms of the log of the number of people working on a growth task, and *growth mechanism* (internal versus external).

[8] To examine if an aggregation of individual responses to the company level was warranted, we calculated within-group agreement

using r_{wg} statistics (James et al. 1984). We found that formal outcome control had the lowest r_{wg} for our dependent and independent variables, at 0.75, which aligns with the consensus cut-off of 0.7 (LeBreton and Senter 2008). We also used using ICC(1) and ICC(*k*) (Bliese 2000) to calculate inter-rater reliability and the reliability of the group mean. While ICC indices have no strict cut-off, LeBreton and Senter (2008) designate indices between 0.31 and 0.50 to suggest at least weak agreement among respondents, 0.51–0.70 suggest moderate agreement, and 0.71–0.90 suggest strong agreement. In our study, with one exception (ICC(*k*) for informal behavior control was 0.56), all ICC(1) indices were 0.72 or higher, and all ICC(*k*) indices were 0.71 or higher, providing further evidence that the aggregation to the group level was justified.

Table 1   Descriptives and Correlations

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1 Firm size (log)	6.74	2.02											
2 Past performance	4.29	1.28	0.08										
3 Growth experience	0.57	0.50	0.08	0.10									
4 Impact duration	4.57	1.32	0.16	−0.07	0.08								
5 Formal input control	3.10	1.34	0.08	0.15	0.12	−0.08							
6 Informal input control	3.67	1.77	−0.05	0.17	0.05	0.08	0.33						
7 Managerial politics	3.34	1.14	0.24	−0.07	−0.17	0.02	−0.08	−0.28					
8 Group politics	2.95	1.36	0.04	−0.02	−0.21	0.09	−0.11	−0.01	0.12				
9 Formal control	5.16	1.06	0.06	−0.03	−0.02	0.00	0.33	0.33	−0.22	−0.10			
10 Informal control	4.76	1.12	−0.17	0.10	0.06	−0.05	0.14	0.33	−0.38	−0.10	0.48		
11 Degree of exploration	3.60	1.08	−0.01	0.07	−0.02	−0.07	0.23	0.22	−0.20	0.06	0.26	0.14	
12 Initiative team performance	5.01	0.76	−0.05	0.21	0.29	−0.12	0.30	0.20	−0.31	−0.33	0.18	0.23	−0.03

Note. $N = 184$; two-tailed tests; correlations with absolute value greater than 0.14 are significant at the 5 percent level.

Table 2   Results of Regression Analysis for Formal and Informal Control and Initiative Team Performance

	Model 1		Model 2		Model 3		Model 4		Model 5a		Model 5b	
Control variables[a]												
Firm size (log)	−0.01	(0.03)	−0.01	(0.03)	−0.01	(0.03)	−0.02	(0.03)	−0.02	(0.03)	−0.01	(0.03)
Past performance	0.11†	(0.05)	0.12*	(0.05)	0.11*	(0.05)	0.11*	(0.05)	0.12*	(0.05)	0.11*	(0.05)
Growth experience	0.21*	(0.11)	0.21†	(0.11)	0.21*	(0.10)	0.22*	(0.10)	0.21*	(0.10)	0.22*	(0.10)
Impact duration	−0.06	(0.05)	−0.07	(0.05)	−0.10*	(0.05)	−0.09†	(0.05)	−0.08	(0.05)	−0.10*	(0.05)
Formal input control	0.15**	(0.05)	0.15**	(0.06)	0.14**	(0.05)	0.13*	(0.05)	0.13*	(0.05)	0.12*	(0.06)
Informal input control	0.05	(0.06)	0.04	(0.06)	0.04	(0.06)	0.05	(0.06)	0.04	(0.06)	0.03	(0.06)
Managerial politics	−0.20***	(0.06)	−0.20***	(0.06)	−0.18**	(0.06)	−0.19***	(0.06)	−0.20***	(0.06)	−0.19***	(0.06)
Group politics	−0.18***	(0.05)	−0.16**	(0.05)	−0.15**	(0.05)	−0.15**	(0.05)	−0.14**	(0.05)	−0.16**	(0.05)
Main effects												
Formal control (fC)			0.08	(0.06)	0.13*	(0.06)	0.12†	(0.06)	0.12†	(0.06)	0.12†	(0.07)
Informal control (iC)			0.06	(0.06)	0.09	(0.06)	0.12†	(0.06)	0.13*	(0.06)	0.11†	(0.06)
Degree of exploration (Expl)			−0.13*	(0.05)	−0.13*	(0.05)	−0.09†	(0.05)				
Market exploration (Expl_M)									−0.01	(0.06)	−0.06	(0.05)
Technology exploration (Expl_T)									−0.10*	(0.05)	−0.09†	(0.05)
Interaction effects												
fC × iC					0.17***	(0.04)	0.14**	(0.05)	0.16***	(0.04)	0.15**	(0.05)
fC × Expl							−0.05	(0.05)				
iC × Expl							0.05	(0.05)				
fC × iC × Expl							−0.09*	(0.04)				
fC × Expl_M									−0.06	(0.06)		
iC × Expl_M									0.01	(0.05)		
fC × iC × Expl_M									−0.10**	(0.04)		
fC × Expl_T											−0.05	(0.05)
iC × Expl_T											0.10	(0.06)
fC × iC × Expl_T											−0.02	(0.05)
Constant	5.01***	(0.38)	5.16***	(0.38)	5.13***	(0.36)	5.18***	(0.36)	5.22***	(0.36)	5.04***	(0.37)
ΔR^2	0.33		0.03		0.06		0.02		0.03		0.01	
R^2	0.33		0.36		0.42		0.44		0.45		0.43	
Adjusted R^2	0.26		0.29		0.35		0.36		0.37		0.35	

Note. $N = 184$; unstandardized coefficients are reported; standard errors in parentheses; $†p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.
    [a]Country and industry dummies are also included.

Hypotheses Tests

Our regression results for the interaction between formal and informal control are presented in Table 2.[9]

[9] We also tested all models without statistical control variables to check for suppression or enhancement effects. The direction and significance levels, however, were the same with and without the control variables. The only exceptions were informal control, which

In Model 1, we included all control variables. In line with prior work (Kreutzer et al. 2015), both managerial and group politics are negatively related to initiative team performance, and past performance,

became significant in Models 2 and 3, and the degree of exploration, which remains negative but is no longer significant in Models 2 and 3.

Table 3   Results of Regression Analysis for Formal and Informal Behavior and Outcome Control and Initiative Team Performance

	Model 6		Model 7		Model 8	
Control variables[a]						
Firm size (log)	−0.01	(0.03)	−0.01	(0.03)	−0.01	(0.03)
Past performance	0.12*	(0.05)	0.11*	(0.05)	0.09†	(0.05)
Growth experience	0.21*	(0.11)	0.23*	(0.10)	0.26**	(0.10)
Impact duration	−0.07	(0.05)	−0.10*	(0.05)	−0.10*	(0.05)
Formal input control	0.15**	(0.06)	0.13*	(0.05)	0.08	(0.06)
Informal input control	0.04	(0.06)	0.02	(0.06)	0.05	(0.06)
Managerial politics	−0.20**	(0.06)	−0.19**	(0.06)	−0.17**	(0.06)
Group politics	−0.16**	(0.05)	−0.17**	(0.05)	−0.13**	(0.05)
Main effects						
Formal behavior control (fBC)	0.06	(0.06)	0.10	(0.06)	0.08	(0.06)
Formal outcome control (fOC)	0.03	(0.07)	0.04	(0.06)	0.10	(0.07)
Informal behavior control (iBC)	0.03	(0.06)	0.06	(0.06)	0.04	(0.06)
Informal outcome control (iOC)	0.02	(0.06)	0.08	(0.06)	0.13*	(0.06)
Degree of exploration (Expl)	−0.14*	(0.05)	−0.13*	(0.05)	−0.08	(0.05)
Interaction effects						
fBC × iBC			0.16**	(0.05)	0.05	(0.06)
fOC × iOC			0.08†	(0.04)	0.14**	(0.05)
fBC × Expl					0.11†	(0.06)
iBC × Expl					0.14*	(0.06)
fBC × iBC × Expl					−0.03	(0.05)
fOC × Expl					−0.18**	(0.06)
iOC × Expl					−0.05	(0.05)
fOC × iOC × Expl					−0.08*	(0.04)
Constant	5.14***	(0.38)	5.08***	(0.36)	5.16***	(0.35)
ΔR^2	0.03		0.07		0.07	
R^2	0.36		0.43		0.50	
Adjusted R^2	0.28		0.35		0.40	

Note. $N = 184$; unstandardized coefficients are reported; standard errors in parentheses; †$p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
   [a]Country and industry dummies are also included.

growth experience, and formal input control, are positive and significant, while informal input control and firm size are not significant. In Model 2, we added formal control, informal control, and the degree of exploration. Formal and informal controls are positive but not significant, and the degree of exploration is significantly and negatively related to initiative team performance ($b = -0.134$, $p = 0.013$). In Model 3, we added the two-way interaction between formal and informal control, which is significant and positive ($b = 0.174$, $p < 0.000$) and explains an additional 6% variance in initiative team performance. As illustrated in Figure 1, we find support for Hypothesis 1: informal control enhances the effect of formal control on the performance of strategic initiative teams, suggesting a complementary effect between formal and informal controls. The results remained the same when we sequentially entered the coefficients for formal and informal control (and their associated interaction effects).
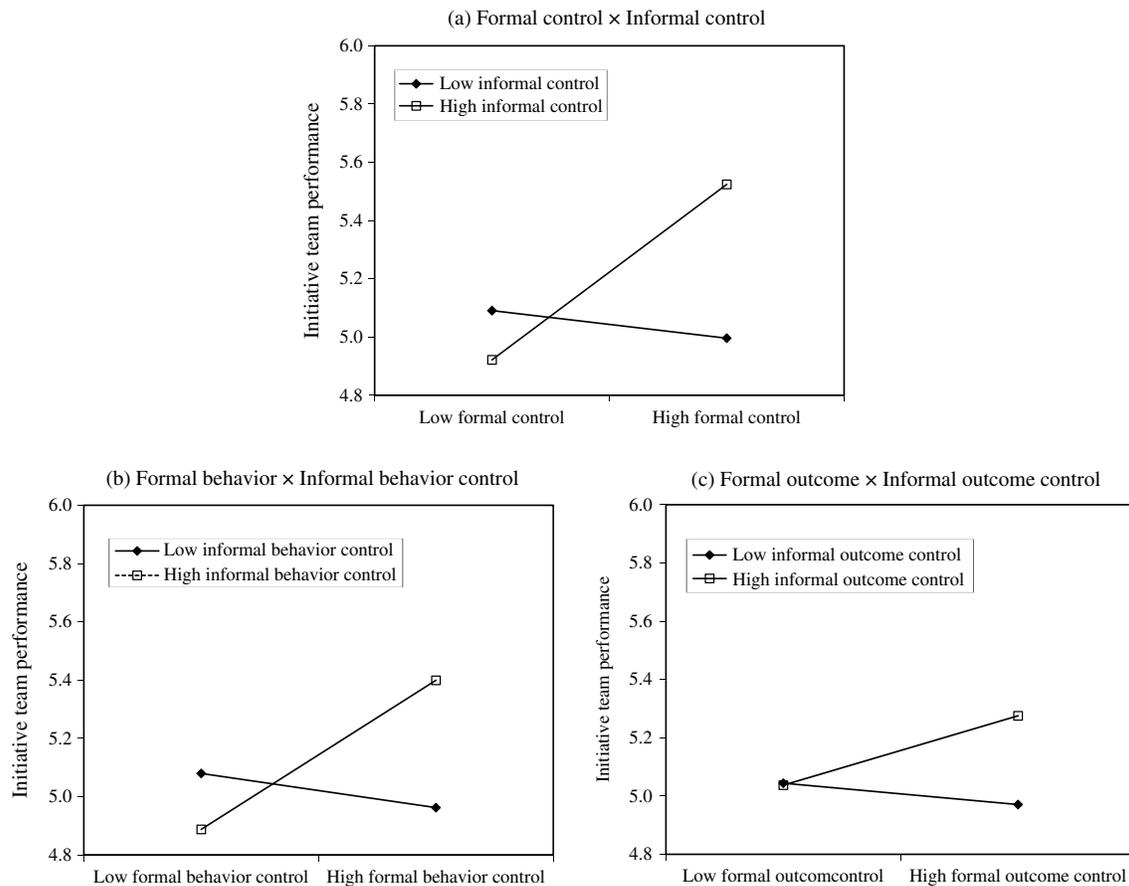
In Model 4, we followed Aiken and West (1991) and introduced the cross-products between control types and the degree of exploration—two- and three-way interaction terms—as a conservative way to test

Hypothesis 2. Model 4 provides support for a moderating influence of the degree of exploration on the complementary effect of formal and informal control on initiative team performance, with the three-way interaction coefficient $b = -0.087$ ($p = 0.026$), by itself, explaining an additional 2% variance in initiative team performance. As Figure 2(a) and its associated simple slope tests illustrate, the complementary effect between formal and informal control on initiative team performance is stronger for lower degrees of exploration ($p < 0.001$ for the slope difference) than higher degrees of exploration ($p = 0.452$), providing support for Hypothesis 2.

Additional Analyses
In addition to the hypotheses tests already reported, we performed an analysis of the magnitude of coefficient estimates. Our results clearly have organizational significance (Shaver 2008), as evident from the hypothesized two-way interaction explaining an additional 6%, and the hypothesized three-way interaction an additional 2%, of variance in initiative team performance, 30 and 10 times, respectively, the average

Figure 1   Plot of Two-Way Interactions

(a) Formal control × Informal control

(b) Formal behavior × Informal behavior control

(c) Formal outcome × Informal outcome control

effect ($f^2 = 0.002$) of moderators in management studies (Aguinis et al. 2005). Moreover, we also calculated the magnitude of the slopes for the three-way interactions displayed in Figure 2(a), which are as follows: 0.12 for slope 1, 0.40 for slope 2, 0.02 for slope 3, and −0.06 for slope 4.

We also distinguished between different types of exploration as reported in Models 5a and 5b in Table 2, which show the interactions between formal and informal control and market and technology exploration, respectively. These results make it evident that market exploration (Model 5a) accounts for the moderating influence of exploration on the complementary effect of formal and informal control on initiative team performance ($b = -0.104$, $p = 0.005$), whereas the three-way interaction with technology exploration (Model 5b) is not significant ($b = -0.022$, $p = 0.659$).

We further re-ran our analyses distinguishing the four control types (formal behavior, informal behavior, formal outcome, informal outcome) and the degree of exploration as independent variables (Model 6 in Table 3). In Model 7, we added the two-way interaction terms between formal and informal behavior control, and between formal and informal outcome control. Both interaction terms are positive and significant

($b = 0.157$, $p = 0.001$ and $b = 0.078$, $p = 0.077$), and are displayed in Figures 1(b) (behavior control) and 1(c) (outcome control). Model 8 shows that formal and informal behavior control independently interact with the degree of exploration ($b = 0.107$, $p = 0.067$ and $b = 0.139$, $p = 0.018$), indicating that both behavioral control types independently have a more positive influence on the performance of strategic initiative teams pursuing higher degrees of exploration. The results also show, however, that this effect is not moderated by the degree of exploration ($b = -0.027$, $p = 0.571$).

Model 8 further provides support for a moderating influence of the degree of exploration on the complementary effect of formal and informal outcome control on initiative team performance ($b = -0.079$, $p = 0.036$). In line with our hypothesis, Figure 2(b) and its associated simple slope tests illustrate that the complementary effect between formal and informal outcome control on initiative team performance is stronger for lower degrees of exploration ($p < 0.001$ for the slope difference) than higher degrees of exploration ($p = 0.307$).

While our test of the three-way interaction with moderated multiple regression analysis is the method

Figure 2(a)   Plot of Three-Way Interaction: Formal Control × Informal Control × Degree of Exploration
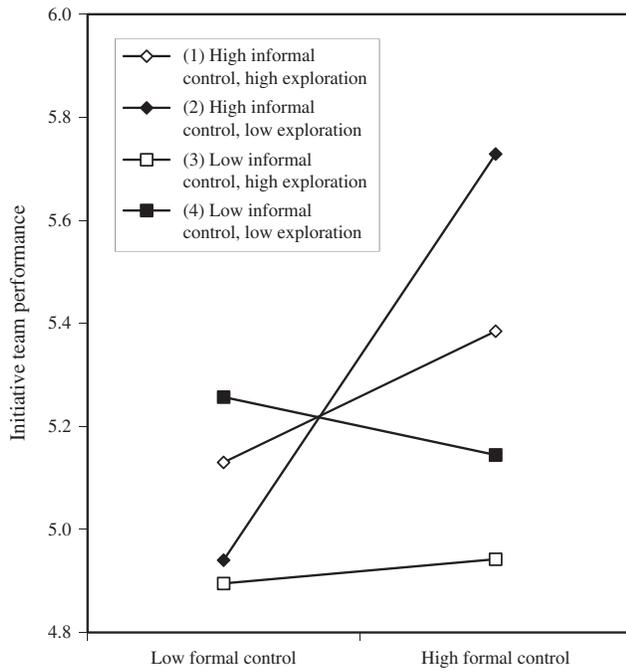
Slope difference tests:

Pair of slopes	*t*-value for slope difference	*p*-value for slope difference
(1) and (2)	−2.04	0.04
(1) and (3)	0.75	0.45
(1) and (4)	1.35	0.18
(2) and (3)	2.75	0.01
(2) and (4)	4.43	0.00
(3) and (4)	0.68	0.50

Figure 2(b)   Plot of Three-Way Interaction: Formal Outcome Control × Informal Outcome Control × Degree of Exploration
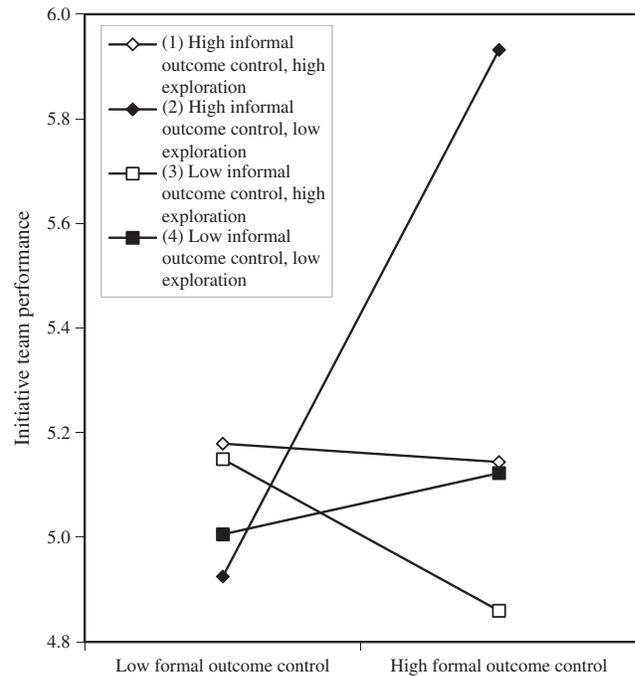
Slope difference tests:

Pair of slopes	*t*-value for slope difference	*p*-value for slope difference
(1) and (2)	−3.30	0.00
(1) and (3)	1.02	0.31
(1) and (4)	−0.58	0.56
(2) and (3)	4.01	0.00
(2) and (4)	3.93	0.00
(3) and (4)	−1.80	0.07

of choice for this type of analysis (Dawson and Richter 2006), we replicated our test of the second hypothesis by conducting a median split-sample analysis. This alternative test strongly supports the conclusions we have drawn from the three-way interaction tests presented: all hypothesized results remain the same.

Building on prior influential work in the strategy literature (e.g., Hamilton and Nickerson 2003, Shaver 1998), it may be the case that firms could choose formal and/or informal control based on the characteristics of strategic initiatives (e.g., initiative team composition, anticipated ease of successful completion, degree of exploration, etc.), firm attributes (e.g., age, size, degree of diversification, etc.), and/or industry conditions (e.g., competition, concentration, etc.). As a result, control choice could be endogenous and self-selected. Simultaneous causality may also be present such that organizational control could be affecting initiative team performance less than the performance of an initiative team encouraging firms to engage in more (or less) control. While we do not have any theoretical

reason to expect initiative team performance to affect the organizational controls designed to manage the team, as strategic initiative teams have clear expectations and goals and are temporary in nature, we chose to address these potential endogeneity concerns.

In line with recommendations in the literature (Bascle 2008, Certo et al. 2016, Hamilton and Nickerson 2003, Podsakoff et al. 2012), we examined the potential for endogeneity by performing a two-stage least-squares (2SLS) regression, the Wu-Hausman *F*-test, and the Durbin-Wu-Hausman test.[10] Following the procedure described by Bascle (2008), we controlled

---

[10] Given our sample size of less than the recommended 200+ observations required for Heckman two-step procedures (Bascle 2008), our seven-point Likert scale for our control variables versus the limited dependent variables required for Heckman two-step procedures (Bascle 2008, Hamilton and Nickerson 2003), and the potential for omitted variables and reverse causality concerns versus the focus of Heckman two-step procedures on sample selection (Certo et al. 2016), we followed the strong preference in the literature for an instrumental variable model over a Heckman selection model.

for endogeneity using three theoretically grounded[11] instrumental variables that affect our control regressors: top management resource influence, resource application rules, and informal input control (see the appendix for all items). To simultaneously instrument for both formal and informal control as well as their interaction within the constraints of our pool of survey items, we followed Bascle's (2008, p. 317) recommendation that "when analysts do not have a lot of instruments, they can interact them," and also used the interaction terms between our three instrumental variables resulting in three additional instrumental variables for a total of six. Using Stata 13.1's *ivreg2* command with the *ffirst* option (Baum et al. 2002), we found the six instrumental variables to be strong—i.e., to satisfy the relevance condition—for formal control ($F(6, 161) = 12.81$; $p < 0.001$) as well as the interaction between formal and informal control ($F(6, 161) = 7.24$; $p < 0.001$), whereas they were weaker for informal control ($F(6, 161) = 4.43$; $p < 0.001$) (Stock and Yogo 2004). Our primary survey data do not entail any alternative, theoretically grounded instrument that may work better for informal control, however. Therefore, we also ran the limited information maximum likelihood (LIML) model, which is recommended as the best choice "when instruments are weak [and . . .] when the sample size is small" (Bascle 2008, p. 298). To ensure the instruments' exogeneity, we used the *overid* command and found the Sargan (1958)/Hansen's *J*-statistic (Hansen 1982) to be nonsignificant (chi-square: 3.59, $p = 0.31$), and thus support for the exogeneity of our six instrumental variables and their appropriateness for the endogeneity correction. The predicted variables from the first stage were then used as instrumental variables in the second-stage ordinary least squares (OLS) regressions to verify the hypothesized relationships. The corrected regression coefficients and significance levels in both the 2SLS model and the LIML

model are consistent to those reported in Model 3 (Table 2). Following the 2SLS model, we ran the *ivendog* command to determine if the corrected model provides better estimators than the pure OLS. Nonsignificant *F* and chi-square tests as part of the Durbin-Wu-Hausman test suggested that the predictor variables in question were exogenous, and their estimates unbiased (Davidson and Mackinnon 1983). These results indicated that endogeneity was not a concern.

While it would be ideal to also examine the exogeneity of our hypothesized three-way interaction, doing so would entail finding four additional instruments (for the degree of exploration, the two additional two-way interactions, and the three-way interaction), which may induce a bias because of the mere number of instruments (Bascle 2008). For this reason, we instead ran a 2SLS model with the split sample along the median of the degree of exploration we previously described. In line with our prediction, we found in the corrected model for low degrees of exploration a positive and significant coefficient for the two-way interaction ($b = 0.33$, $p < 0.001$). The instruments were strong for formal control ($F(6, 70) = 13.74$, $p < 0.001$) and the two-way interaction between formal and informal control ($F(6, 70) = 18.56$, $p < 0.001$) and weaker for informal control ($F(6, 70) = 5.73$, $p < 0.001$). Because our split sample size is small, we also ran the LIML model (Bascle 2008) with similar results. For high degrees of exploration, we find no significant interaction between formal and informal control. These 2SLS models thus further corroborate our support for Hypothesis 2.

Discussion

Our findings from an analysis of 184 strategic initiative teams in a cross-industry multicountry sample of firms provide theoretical and empirical support for the complementarity view of organizational control. That is, formal and informal controls reinforce each other and, together, have a positive influence on the performance of strategic initiative teams. We also find support for our argument that the performance impact of a complementary use of organizational controls is dependent on the task context, in particular, on the degree of exploration that strategic initiative teams are pursuing: it is more pronounced in less exploratory initiatives.

Theoretical Implications
Our findings have several implications for both theory and managerial practice. First, our study complements and extends recent work on the interplay between formal behavior control and formal outcome control (Kreutzer et al. 2015) and between norm strength and peer pressure (De Jong et al. 2014). It therefore represents another crucial building block in the cumulative development of a "balanced" (Sutcliffe et al. 2000) or "holistic" approach to organizational control (Cardinal

---

[11] Based on the existing literature, all instrumental variables could be correlated with formal and informal control (as well as their interaction). Specifically, the more top managers were the ones deciding on the amount, type, and quality of resources allocated to a specific growth initiative, the more they may be likely to formally monitor and evaluate the extent to which the initiative team follows established procedures, and the more they may track and evaluate the achievement of dates, milestones, performance goals, or cost budgets. The same logic applies to the existence of clear procedures and rules for resource application. If, for example, a business case needs to be prepared, this already entails the specification of formal procedures, milestones, and other outcome targets, and thereby may imply a heavier focus on formal controls. Based on the alignment and attention argument presented in the paper, these two instruments can theoretically influence informal control as well. Lastly, informal control, or the extent to which managers informally observe new team members to see if they fit the initiative teams when they first join the team, may influence managers' subsequent interaction styles, that is, potentially increase the extent to which managers informally engage with team members.

2001; Cardinal et al. 2004, 2010). Such an approach highlights the coexistence of both behavior and outcome control as well as formal and informal control in organizations and recognizes "that individual pieces of the control puzzle do not operate in isolation" (Cardinal et al. 2010, p. 73) but instead interact with each other. This approach helps the field to advance beyond the relatively prescriptive, "either-or" nature of early control research (Sitkin and Bies 1994a). It further resonates with recent governance research that has also focused on bundles of governance mechanisms (instead of studying their independent effects irrespective of other mechanisms) and talks about a more "holistic approach" to corporate governance research (e.g., Misangyi and Acharya 2014).

Second, our theory and results also diverge from the classic control literature that emphasizes the feasibility of control as the determining factor in control use (Ouchi 1979). According to this view, formal behavior control and formal outcome control are only feasible if behavior and/or outcomes can be accurately measured. If that is not the case, the classic control literature suggests relying instead on informal control (Eisenhardt 1985, Ouchi 1979). A fledgling stream of research, however, has provided evidence supporting the value of formal control even in settings in which neither behavior nor outcome can be accurately observed and measured (Brenner and Ambos 2013, Cardinal 2001), leading to recent criticisms of such a feasibility focus. More specifically, since Ouchi (1977, 1979) developed his organizational control framework in the late 1970s, "organizational work has made the transition to more knowledge work with a greater level of uncertainty in process and goals, greater interdependence among individuals, and hence more focus on teamwork" (Kirsch and Choudhury 2010, p. 302). Whereas earlier control research was conducted in stable organizations with routine processes (e.g., Ouchi's work), strategic initiative teams have become a centerpiece for organizational renewal processes (Lechner and Floyd 2012, Lechner and Kreutzer 2011, Nag et al. 2007, Saunders et al. 2008), involving initiatives that are time-bound, nonroutine, team-based, and often geographically dispersed (Hagel et al. 2010), with greater uncertainty and ambiguity than day-to-day activities. As Kirsch and Choudhury (2010, p. 302) have pointed out, with the organizational environment becoming "more complex and fluid, management processes, including control, may need to change accordingly." Our study complements and extends this research stream by showing that even highly exploratory settings, such as strategic initiatives in which teams have little knowledge of transformation processes *and* are confronted with low outcome measurability, are amenable to formal organizational controls. As our findings demonstrate,

however, the value of formal controls in these settings can only be realized when combined with their informal counterparts, thereby mitigating limitations and deficiencies inherent in formal controls. When employed individually, none of the four types of control had a statistically significant effect on initiative team performance.

Third, our additional analyses distinguishing between different targets of control and between market and technological exploration show a slightly more complex pattern of results and, therefore, offer a more nuanced understanding of the efficacy of organizational controls in different task contexts. Regarding different targets of control, our findings show that, as expected, the complementary effects of formal and informal *outcome* control are more pronounced for initiative teams pursuing lower degrees of exploration. In contrast to our expectations, however, the complementary effects of formal and informal *behavior* control are evident across the entire spectrum of initiative team degree of exploration. While not jointly interacting with the degree of exploration, formal and informal behavior control independently interacted with the degree of exploration on initiative team performance. These results suggest that even in highly exploratory initiative teams where technological and market knowledge are imperfect (Bello and Gilliland 1997), the usual risks inherent in formal behavior control of stifling variation due to team members' autonomous behaviors (Burgelman 1983) and "legalizing" (Sitkin and Bies 1994b) certain behaviors at the expense of potentially more innovative behaviors can be mitigated by complementing formal with informal behavior control.

Regarding different types of exploration (Burgers et al. 2008, Danneels 2002), we find that the proposed contingency effect of the degree of exploration is primarily due to market exploration, whereas we find no evidence for such an effect with respect to technological exploration. Our findings corroborate a prior work's suggestion that management and control requirements differ between these two types of exploration (Burgers et al. 2008) and suggest that the central differences of technological and market knowledge, in terms of timing (technology-related work normally comes first, market-related exploration later) and residence (technology knowledge resides in R&D departments, market knowledge in marketing/sales departments) have an influence on the independent and joint effects of formal and informal control on performance outcomes.

Our findings also provide some insight into whether and to what extent our results apply to other organizational settings than the one we examined. Specifically, our results show that the positive interaction effect

between formal and informal control is even more pronounced in less exploratory growth initiatives. This would suggest that a complementary control approach would also be beneficial—and perhaps even more so—for other, less uncertain strategic initiatives, such as cost or efficiency initiatives (Kreutzer and Lechner 2010), as well as more stable and routine tasks outside the context of strategic initiatives, such as the ones related to the ongoing, day-to-day business. For even more uncertain settings, such as cutting-edge research and development projects, however, our results would suggest diminishing benefits of jointly using formal and informal controls. Case in point, studying the fuzzy front end of innovation, Poskela and colleagues (2009) found that under conditions of high uncertainty, the use of formal controls has a negative influence. Despite this evidence, whether and to what extent a complementary approach to organizational control is effective for different organizational settings, particularly for those not relying on team-based organization, remains to be empirically verified and thus represents a fruitful avenue for future research.

Managerial Implications

In their recent review of the field, Cardinal and colleagues (2010, p. 73) concluded that "if organizational control research is to be more practically relevant, those conducting it must take account of the complexity and dynamism that organizations and their members actually confront." Our focus on the team-based and nonroutine context of strategic initiatives provides us with unique insights into the practical challenges, but also opportunities, of organizational control in modern organizations.

Our theorizing and findings should remind managers of Ashby's (1956) law of requisite variety, according to which the larger the variety of actions available to a control system, the larger the variety of perturbations it is able to compensate/regulate. In particular, while a reliance on formal controls may be feasible for more routine tasks, a complementary approach including informal and formal controls allows managers to more effectively deal with a changing environment both within organizations—i.e., more temporary, team-based work crossing units, divisions, and disciplines—and outside the organization, such as strategic initiatives in response to growth requirements amidst constant environmental change and disruptions.

Our results should also sensitize managers to how important it is for them to "walk the talk" and thereby align their words and deeds (Greenbaum et al. 2015, Simons 2002). That is, managers in charge of strategic initiatives need to align their formal control apparatus—such as the behaviors that are monitored, the outcomes that are evaluated, and the incentives that are set—with the spirit and substance of their informal control actions. Any deviation between the behaviors or outcomes that are formally monitored or rewarded and the ones emphasized in informal controls may be perceived as "bad" or hypocritical leadership and likely jeopardize initiative team performance.

While strategic initiatives have become central to the strategic management of organizations (Nag et al. 2007), their practical execution is often challenging, with success rates between 30% and 50% (Saunders et al. 2008). Having the full array of control types at their disposal, managers can mindfully leverage informal controls to complement their formal counterparts to help improve the success rates of strategic initiatives. With most firms pursuing a concurrent portfolio of more and less exploratory initiatives (Raisch and Birkinshaw 2008, Simsek 2009), however, a careful identification of the initiative type should precede the initiative-execution process and guide the adaptation of their control choices for initiative teams. Otherwise, our divergent results for higher and lower degrees of exploration echo prior studies' warnings against the problematic consequences of managers ignoring or misperceiving interactions between organizational activities and, particularly, of managers assuming complementary effects when they do not exist (Siggelkow 2002).

Limitations and Future Research Questions

As strategic initiative teams have clear expectations and goals and are temporary in nature (Lechner and Kreutzer 2011), we do not have any theoretical reason to expect initiative team performance to affect the organizational controls designed to manage initiative teams. The results from our 2SLS endogeneity correction further suggest that reverse causality is not likely for our hypothesized relationships. Nevertheless, we cannot formally ascertain causality due to the cross-sectional nature of our data, and future research using longitudinal models could help corroborate our findings in this regard. To further reduce endogeneity concerns based on omitted variables and self-selection bias, we suggest that future research could also investigate alternative, theoretically derived instruments of organizational control, such as: organizational culture (e.g., Ocasio and Wohlgezogen 2010, Van Maanen 2010), which may act as an institutional setting for the controller-controllee interaction; social capital, which may facilitate particularly informal control (e.g., Kirsch et al. 2010); or personal characteristics of the controller, such as leadership style (e.g., Otley and Pierce 1995), which may affect their choices of formal and/or informal control; etc.

We further focused our study on growth initiatives. Our additional analyses provide some evidence for the generalizability of our findings to other, more and less

exploratory settings (see our discussion in the Results section for details). Despite this evidence, strategic initiatives cover "a broad set of managerial topics" and prior conceptual work has suspected "that each type of strategic initiative is likely to benefit from a distinct control configuration able to accommodate its needs" (Kreutzer and Lechner 2010, p. 466). Only future research can therefore provide a definite answer to the question of whether our results would apply equally to other organizational settings such as cost-cutting, restructuring, or cutting-edge R&D initiatives as well as more routine tasks, or if we have to incorporate additional task contingencies into our theorizing. In line with such a broader focus on organizational control settings, going beyond initiative team performance and examining other performance outcomes (see Miller et al. 2013, for a richer treatise of firm performance) seems warranted.

Moreover, with strategic initiatives cycling through distinct stages, future research could also track the influence of control over the life cycle of initiative development, uncovering optimal control combinations of formal and informal controls for different initiative phases (Davila 2000), and thus extending our knowledge about control dynamics (Cardinal et al. 2010). Moving beyond two-way interactions between controls toward configurational approaches that examine a fuller array of control mechanisms would further advance our understanding of holistic (Cardinal et al. 2010) control approaches. For instance, while both formal and informal controls are representative of a hierarchical control regime—i.e., controls that largely fall under managers' discretion and authority (Loughry 2010)—future research could examine whether such hierarchical controls can be successfully complemented by nonhierarchical controls, such as peer control, or team members noticing and responding to their peers' behavior or performance results (e.g., Loughry and Tosi 2008).

Lastly, given our theoretical focus on hierarchical controls and our interest in understanding the performance implications of managers implementing different combinations of formal and informal controls, our empirical analyses focused on managers' assessments of organizational controls. It is conceivable, however, that team members' perceptions of formal and informal control may diverge from managers' assessments. Future research could therefore compare and contrast managers' and team members' perceptions and shed light on potential implications of any discrepancies for performance outcomes.

In conclusion, our study of strategic initiative teams across multiple industries provides broad support for the proposed benefits of a joint use of formal and informal controls and suggests that the degree of exploration at least partially moderates this effect.

By acknowledging complementarity between different control types, as well as the moderating influence of the task environment, our study contributes to a more nuanced understanding of organizational control and its effects on performance outcomes. It represents another important step in the cumulative development of a more comprehensive, holistic view on organizational control.

Appendix: Survey Items

Past performance. Please compare the performance of your organization relative to your competitors three years ago in terms of: (1) Sales. (2) EBIT. [Cronbach's alpha = 0.82]

Growth experience. Please specify the past behavior of your firm by selecting your main focus in the last three years. Please split 100% on the different foci: Growth − Cost − Quality − Customer/Clients − Other [coded as 1 = if percentage of growth focus in the past was >=25%; 0 = otherwise].

Impact duration. Please assess the duration until the growth initiative has impact on earnings (1 = very low; 7 = very high).

Managerial politics. (1) Growth managers were encouraged to speak out frankly even when they are critical of well-established ideas (1 = strongly disagree; 7 = strongly agree). (2) Growth managers were able to challenge the strategic views of top management team members (1 = not at all; 7 = to a very great extent). (3) Growth managers were able to refute the strategic views of top management team members (1 = not at all; 7 = to a very great extent). [All items reverse-coded; Cronbach's alpha = 0.71]

Group politics. (1) There were "cliques" or "in-groups" that hinder the effectiveness of our growth initiatives. (2) Informal networks rather than merit determined who got ahead. (1 = strongly disagree; 7 = strongly agree) [Cronbach's alpha = 0.70]

Formal input control. (1) Managers had to undergo a series of formal evaluations before they were selected to work on growth initiatives. (2) We had explicit criteria for selecting people for our growth initiatives. (3) Managers received substantial formal training (task-related knowledge, e.g., market knowledge) before they assumed responsibility in growth initiatives. [Cronbach's alpha = 0.74]

Informal input control. (1) New team members were informally observed to see if they fit the growth initiative teams when they first join the team.

Formal control. (1) Top management monitored the extent to which growth initiatives followed established procedures. (2) Top management evaluated the procedures growth initiatives used to accomplish a given task. (3) Top management modified the growth initiatives' procedures when desired results were not obtained. (4) Specific dates were established and monitored for growth initiatives' milestones. (5) Specific performance goals were established and monitored for the growth initiatives. (6) Critical growth initiatives' cost budgets were established and monitored. (7) Performance evaluations placed primary weight on results. [Cronbach's alpha = 0.84]

Formal behavior control. (1) Top management monitored the extent to which growth initiatives followed established procedures. (2) Top management evaluated the procedures growth initiatives used to accomplish a given task. (3) Top management modified the growth initiatives' procedures when desired results were not obtained. [Cronbach's alpha = 0.77]

Formal outcome control. (4) Specific dates were established and monitored for growth initiative milestones. (5) Specific performance goals were established and monitored for the growth initiatives. (6) Critical growth initiatives' cost budgets were established and monitored. (7) Performance evaluations placed primary weight on results. [Cronbach's alpha = 0.86]

Informal control. (1) Growth managers received ongoing feedback on how they can improve their day-to-day processes on growth initiatives. (2) Top management shared stories about previous growth initiative successes and failures. (3) Growth managers frequently received verbal praise for good results. (4) Top management often encouraged growth managers to reach their goals. [Cronbach's alpha = 0.75]

Informal behavior control. (1) Growth managers received ongoing feedback on how they can improve their day-to-day processes on growth initiatives. (2) Top management shared stories about previous growth initiative successes and failures. [Cronbach's alpha = 0.69]

Informal outcome control. (3) Growth managers frequently received verbal praise for good results. (4) Top management often encouraged growth managers to reach their goals. [Cronbach's alpha = 0.82]

Degree of exploration. To what extent were the following characteristics or factors of your growth initiatives *new* to the company? (1) The markets served. (2) The clients served. (3) The competition faced. (4) The distribution channels. (5) The products and/or services offered. (6) The systems used. (7) The technology used. (1 = to no extent; 7 = to a very great extent) [Cronbach's alpha = 0.76]

Degree of market exploration. (1) The markets served. (2) The clients served. (3) The competition faced. (4) The distribution channels. [Cronbach's alpha = 0.74]

Degree of technology exploration. (5) The products and/or services offered. (6) The systems used. (7) The technology used. [Cronbach's alpha = 0.66]

Initiative team performance. Please assess the performance of your growth initiatives (up to now) on each of the following criteria: (1) Meeting budget objectives. (2) Meeting staffing objectives. (3) Meeting major deadlines. (4) Meeting quality objectives. (5) Meeting reliability objectives. (6) Meeting cost objectives. (7) Meeting efficiency objectives. (8) Meeting user/client satisfaction objectives. (9) Meeting service objectives. (10) Meeting revenue parameters. (11) Meeting objective overall. (1 = very unsuccessful; 7 = very successful) [Cronbach's alpha = 0.88]

Top management resource influence (for endogeneity tests). (1) Top management decided on the amount of resources allocated to growth initiatives. (2) Top management decided on the type and quality of resources allocated to growth initiatives. (1 = strongly disagree; 7 = strongly agree) [Cronbach's alpha = 0.71]

Resource application rules (for endogeneity tests). There were clear procedures and rules to apply for resources. (1 = strongly disagree; 7 = strongly agree)

References

Abernethy MA, Brownell P (1997) Management control systems in research and development organizations: The role of accounting, behavior and personnel controls. *Accounting Organ. Soc.* 22(3–4):233–248.

Aguinis H, Beaty JC, Boik RJ, Pierce CA (2005) Effect size and power in assessing moderating effects of categorical variables using multiple regression: A 30-year review. *J. Appl. Psych.* 90(1):94–107.

Aiken LS, West SG (1991) *Multiple Regression: Testing and Interpreting Interactions* (Sage Publications, Newbury Park, CA).

American Psychological Association (1985) *Standards for Educational and Psychological Testing* (American Psychological Association, Washington, DC).

Armstrong JS, Overton TS (1977) Estimating nonresponse bias in mail surveys. *J. Marketing Res.* 14(3):396–402.

Arthur JB (1994) Effects of human-resource systems on manufacturing performance and turnover. *Acad. Management J.* 37(3): 670–687.

Ashby WR (1956) *An Introduction to Cybernetics* (Chapman & Hall, London).

Auh S, Mengue B (2007) Performance implications of the direct and moderating effects of centralization and formalization on customer orientation. *Indust. Marketing Management* 36(8): 1022–1034.

Baker G, Gibbons R, Murphy KJ (1999) Informal authority in organizations. *J. Law Econom. Organ.* 15(1):56–73.

Baker G, Gibbons R, Murphy KJ (2002) Relational contracts and the theory of the firm. *Quart. J. Econom.* 117(1):39–84.

Barnard CI (1938) *The Functions of the Executive* (Harvard University Press, Cambridge, MA).

Bascle G (2008) Controlling for endogeneity with instrumental variables in strategic management research. *Strategic Organ.* 6(3):285–327.

Baum CF, Schaffer ME, Stillman S (2002) *IVENDOG: Stata Module to Calculate Durbin-Wu-Hausman Endogeneity Test After Ivreg.* Boston College Department of Economics, Boston. Accessed August 4, 2013, http://ideas.repec.org/c/boc/bocode/s429401.html.

Bello DC, Gilliland DI (1997) The effect of output controls, process controls, and flexibility on export channel performance. *J. Marketing* 61(1):22–38.

Blau PM (1955) *The Dynamics of Bureaucracy: A Study of Interpersonal Relations in Two Government Agencies* (University of Chicago Press, Chicago).

Bliese PD (2000) Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. Klein KK, Kozlowski SWJ, eds. *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions and New Directions* (Jossey-Bass, San Francisco), 349–381.

Bollen KA, Long JS (1993) Introduction. Bollen KA, Long JS, eds. *Testing Structural Equation Models* (Sage, London), 1–9.

Bonner JM, Ruekert RW, Walker OC (2002) Upper management control of new product development projects and project performance. *J. Product Innovation Management* 19(3):233–245.

Brenner B, Ambos B (2013) A question of legitimacy? A dynamic perspective on multinational firm control. *Organ. Sci.* 24(3): 773–795.

Burgelman RA (1983) A process model of internal corporate venturing in the diversified major firm. *Admin. Sci. Quart.* 28(2): 223–244.

Burgers JH, Van Den Bosch FAJ, Volberda HW (2008) Why new business development projects fail: Coping with the differences of technological versus market knowledge. *Long Range Planning* 41(1):55–73.

Cardinal LB (2001) Technological innovation in the pharmaceutical industry: The use of organizational control in managing research and development. *Organ. Sci.* 12(1):19–36.

Cardinal LB, Miller CC, Palich LE (2011) Breaking the cycle of iteration: Forensic failures of international diversification and firm performance research. *Global Strategy J.* 1(1–2):175–186.

Cardinal LB, Sitkin SB, Long CP (2004) Balancing and rebalancing in the creation and evolution of organizational control. *Organ. Sci.* 15(4):411–431.

Cardinal LB, Sitkin SB, Long CP (2010) A configurational theory of control. Sitkin SB, Cardinal LB, Bijlsma-Frankema K, eds. *Organizational Control* (Cambridge University Press, Cambridge, UK), 51–79.

Certo ST, Busenbark JR, Woo H-S, Semadeni M (2016) Sample selection bias and Heckman models in strategic management research. *Strategic Management J.*, ePub ahead of print February 9, http://dx.doi.org/10.1002/smj.2475.

Chattopadhyay P, Glick WH, Huber GP (2001) Organizational actions in response to threats and opportunities. *Acad. Management J.* 44(5):937–955.

Daft RL, Lengel RH (1986) Organizational information requirements, media richness and structural design. *Management Sci.* 32(5):554–571.

Danneels E (2002) The dynamics of product innovation and firm competences. *Strategic Management J.* 23(12):1095–1121.

Davidson R, Mackinnon J (1983) *Estimation and Interference in Economics* (Oxford University Press, New York).

Davila T (2000) An empirical study on the drivers of management control systems' design in new product development. *Accounting Organ. Soc.* 25(4–5):383–409.

Dawson JF, Richter AW (2006) Probing three-way interactions in moderated multiple regression: Development and application of a slope difference test. *J. Appl. Psych.* 91(4):917–926.

De Jong BA, Bijlsma-Frankema KM, Cardinal LB (2014) Stronger than the sum of its parts? The performance implications of peer control combinations in teams. *Organ. Sci.* 25(6):1703–1721.

Eisenhardt KM (1985) Control: Organizational and economic approaches. *Management Sci.* 31(2):134–149.

Eisenhardt EM, Sull DN (2001) Strategy as simple rules. *Harvard Bus. Rev.* 79(1):106–116.

Greenbaum RL, Mawritz MB, Piccolo RF (2015) When leaders fail to "Walk the Talk": Supervisor undermining and perceptions of leader hypocrisy. *J. Management* 41(3):929–956.

Gupta AK, Smith KG, Shalley CE (2006) The interplay between exploration and exploitation. *Acad. Management J.* 49(4): 693–706.

Hagel J, Brown JS, Jelinek M (2010) Relational networks, strategic advantage: Collaborative control is fundamental. Sitkin SB, Cardinal L, Bijlsma-Frankema K, eds. *Organizational Control* (Cambridge University Press, Cambridge, UK), 251–300.

Hair JF, Black WC, Babin BJ, Anderson RE, Tatham RL (2009) *Multivariate Data Analysis*, 7th ed. (Prentice-Hall, Upper Saddle River, NJ).

Hambrick DC, Geletkanycz MA, Fredrickson JW (1993) Top executive commitment to the status-quo: Some tests of its determinants. *Strategic Management J.* 14(6):401–418.

Hamilton BH, Nickerson JA (2003) Correcting for endogeneity in strategic management research. *Strategic Organ.* 1(1):51–78.

Hansen LP (1982) Large sample properties of generalized-method of moments estimators. *Econometrica* 50(4):1029–1054.

Hu LT, Bentler PM (1995) Evaluating model fit. Hoyle RH, ed. *Structural Equation Modeling: Concepts, Issues, and Applications* (Sage, Thousand Oaks, CA), 76–99.

Jackson SE, Schuler RS, Rivero JC (1989) Organizational characteristics as predictors of personnel practices. *Personnel Psych.* 42(4):727–786.

James LR, Demaree RG, Wolf G (1984) Estimating within-group interrater reliability with and without response bias. *J. Appl. Psych.* 69(1):85–98.

Jenkins GD, Mitra A, Gupta N, Shaw JD (1998) Are financial incentives related to performance? A meta-analytic review of empirical research. *J. Appl. Psych.* 83(5):777–787.

Judge TA, Piccolo RF (2004) Transformational and transactional leadership: A meta-analytic test of their relative validity. *J. Appl. Psych.* 89(5):755–768.

Kerr S, Jermier JM (1978) Substitutes for leadership: Their meaning and measurement. *Organ. Behav. Human Performance* 22(3): 375–403.

Kirsch LJ, Choudhury V (2010) Toward a theory of relational control: How relationship structure influences the choice of control. Sitkin SB, Cardinal LB, Bijlsma-Frankema K, eds. *Organizational Control* (Cambridge University Press, Cambridge, UK), 301–323.

Kirsch LJ, Ko D-G, Haney MH (2010) Investigating the antecedents of team-based clan control: Adding social capital as a predictor. *Organ. Sci.* 21(2):469–489.

Kreutzer M, Lechner C (2010) Control configurations and strategic initiatives. Sitkin SB, Cardinal LB, Bijlsma-Frankema KM, eds. *Organizational Control* (Cambridge University Press, Cambridge, UK), 463–503.

Kreutzer M, Walter J, Cardinal LB (2015) Organizational control as an antidote to politics in the pursuit of strategic initiative performance? *Strategic Management J.* 36(9):1317–1337.

Lazzarini SG, Miller GJ, Zenger TR (2004) Order with some law: Complementarity versus substitution of formal and informal arrangements. *J. Law, Econom. Organ.* 20(2):261–298.

LeBreton JM, Senter JL (2008) Answers to 20 questions about interrater reliability and interrater agreement. *Organ. Res. Methods* 11(4):815–852.

Lechner C, Floyd SW (2012) Group influence activities and the performance of strategic initiatives. *Strategic Management J.* 33(5):478–495.

Lechner C, Kreutzer M (2011) Strategic initiatives: Past, present and future. Mazzola P, Kellermanns FW, eds. *Handbook of Strategy Process Research* (Edward Elgar Publishing, Cheltenham, UK), 283–303.

Lechner C, Frankenberger K, Floyd SW (2010) Task contingencies in the curvilinear relationships between intergroup networks and initiative performance. *Acad. Management J.* 53(4):865–889.

Locke EA, Latham GP (1990) *A Theory of Goal Setting and Task Performance* (Prentice-Hall, Englewood Cliffs, NJ).

Locke EA, Latham GP (2005) Goal setting theory. Theory building by induction. Smith KG, Hitt MA, eds. *Great Minds in Management. The Process of Theory Development* (Oxford University Press, Oxford, UK), 128–150.

Long CP, Bendersky C, Morrill C (2011) Fairness monitoring: Linking managerial controls and fairness judgements in organizations. *Acad. Management J.* 54(5):1045–1068.

Long CP, Burton RM, Cardinal LB (2002) Three controls are better than one: A computational model of complex control systems. *Computational Math. Organ. Theory* 8(3):197–220.

Loughry ML (2010) Peer control in organizations. Sitkin SB, Cardinal LB, Bijlsma-Frankema K, eds. *Organizational Control* (Cambridge University Press, Cambridge, UK), 324–361.

Loughry ML, Tosi HL (2008) Performance implications of peer monitoring. *Organ. Sci.* 19(6):876–890.

Lovas B, Ghoshal S (2000) Strategy as guided evolution. *Strategic Management J.* 21(9):875–896.

Maydeu-Olivares A, Lado N (2003) Market orientation and business economic performance—A mediated model. *Internat. J. Service Indust. Management* 14(3–4):284–309.

McGrath RG (2001) Exploratory learning, innovative capacity, and managerial oversight. *Acad. Management J.* 44(1):118–131.

Miller CC, Cardinal LB, Glick WH (1997) Retrospective reports in organizational research: A reexamination of recent evidence. *Acad. Management J.* 40(1):189–204.

Miller CC, Washburn NT, Glick WH (2013) The myth of firm performance. *Organ. Sci.* 24(3):948–964.

Misangyi VF, Acharya AG (2014) Substitutes or complements? A configurational examination of corporate governance mechanisms. *Acad. Management J.* 57(6):1681–1705.

Mulaik SA, James LR, Alstine JV, Bennett N, Ling S, Stilwell CD (1989) Evaluation of goodness-of-fit for structural equation models. *Psych. Bull.* 105(3):430–445.

Nag R, Hambrick DC, Chen MJ (2007) What is strategic management, really? Inductive derivation of a consensus definition of the field. *Strategic Management J.* 28(9):935–955.

Ocasio W, Wohlgezogen F (2010) Attention and control. Sitkin SB, Cardinal L, Bijlsma-Frankema K, eds. *Organizational Control* (Cambridge University Press, Cambridge, UK), 191–221.

Otley DT, Pierce BJ (1995) The control problem in public accounting firms—An empirical study of the impact of leadership style. *Accounting Organ. Soc.* 20(5):405–420.

Ouchi WG (1977) Relationship between organizational structure and organizational control. *Admin. Sci. Quart.* 22(1):95–113.

Ouchi WG (1979) A conceptual framework for the design of organizational control mechanisms. *Management Sci.* 25(9):833–848.

Ouchi WG, Maguire MA (1975) Organizational control: Two functions. *Admin. Sci. Quart.* 20(4):559–569.

Peterson KD (1984) Mechanisms of administrative control over managers in educational organizations. *Admin. Sci. Quart.* 29(4):573–597.

Podsakoff PM, MacKenzie SB, Podsakoff NP (2012) Sources of method bias in social science research and recommendations on how to control it. *Annual Rev. Psych.* 63:539–569.

Podsakoff PM, MacKenzie SB, Lee JY, Podsakoff NP (2003) Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psych.* 88(5):879–903.

Poppo L, Zenger T (2002) Do formal contracts and relational governance function as substitutes or complements? *Strategic Management J.* 23(8):707–725.

Poskela J, Martinsuo M (2009) Management control and strategic renewal in the front end of innovation. *J. Product Innovation Management* 26(6):671–684.

Raisch S, Birkinshaw J (2008) Organizational ambidexterity: Antecedents, outcomes, and moderators. *J. Management* 34(3):375–409.

Ramaswami SN (1996) Marketing controls and dysfunctional employee behaviors: A test of traditional and contingency theory postulates. *J. Marketing* 60(2):105–120.

Sargan JD (1958) The estimation of economic relationships using instrumental variables. *Econometrica* 26(3):393–415.

Saunders M, Mann R, Smith R (2008) Implementing strategic initiatives: A framework of leading practices. *Internat. J. Oper. Production Management* 28(11–12):1095–1123.

Shaver JM (1998) Accounting for endogeneity when assessing strategy performance: Does entry mode choice affect FDI survival? *Management Sci.* 44(4):571–585.

Shaver JM (2008) Organizational significance. *Strategic Organ.* 6(2):185–193.

Siegel J (2008) Lincoln Electric. Harvard Business School case study #9-707-445, Boston.

Siemsen E, Roth A, Oliveira P (2010) Common method bias in regression models with linear, quadratic, and interaction effects. *Organ. Res. Methods* 13(3):456–476.

Siggelkow N (2002) Misperceiving interactions among complements and substitutes: Organizational consequences. *Management Sci.* 48(7):900–916.

Simons R (1991) Strategic orientation and top management attention to control systems. *Strategic Management J.* 12(1):49–62.

Simons R (1994) How new top managers use control systems as levers of strategic renewal. *Strategic Management J.* 15(3):169–189.

Simons T (2002) Behavioral integrity: The perceived alignment between managers' words and deeds as a research focus. *Organ. Sci.* 13(1):18–35.

Simsek Z (2009) Organizational ambidexterity: Towards a multilevel understanding. *J. Management Stud.* 46(4):597–624.

Simsek Z, Heavey C, Veiga JF (2010) The impact of CEO core self-evaluation on the firm's entrepreneurial orientation. *Strategic Management J.* 31(1):110–119.

Sitkin SB, Bies RJ, eds. (1994a) *The Legalistic Organization* (Sage Publications, Thousand Oaks, CA).

Sitkin SB, Bies RJ (1994b) The legalization of organizations: A multi-theoretical perspective. Sitkin SB, Bies RJ, eds. *The Legalistic Organization* (Sage Publications, Thousand Oaks, CA), 19–49.

Sitkin SB, Roth NL (1993) Explaining the limited effectiveness of legalistic "remedies" for trust/distrust. *Organ. Sci.* 4(3):367–392.

Sitkin SB, Cardinal LB, Bijlsma-Frankema KM, eds. (2010) *Organizational Control* (Cambridge University Press, Cambridge, UK).

Sorensen JB (2002) The strength of corporate culture and the reliability of firm performance. *Admin. Sci. Quart.* 47(1):70–91.

Stewart GL, Courtright SH, Barrick MR (2012) Peer-based control in self-managing teams: Linking rational and normative influence with individual and group performance. *J. Appl. Psych.* 97(2):435–447.

Stock JH, Yogo M (2004) Testing for weak instruments in linear IV regression. Working paper, Department of Economics, Harvard University, Cambridge, MA.

Sutcliffe KM, Sitkin SB, Browning LD (2000) Tailoring process management to situational requirements. Cole RE, Scott WR, eds. *The Quality Movement and Organization Theory* (Sage Publications, Thousand Oaks, CA), 315–330.

Thompson JD (1967) *Organizations in Actions* (McGraw-Hill, New York).

Turner KL, Makhija MV (2006) The role of organizational controls in managing knowledge. *Acad. Management Rev.* 31(1):197–217.

Van Maanen J (2010) Identity work and control in occupational communities. Sitkin SB, Cardinal L, Bijlsma-Frankema K, eds. *Organizational Control* (Cambridge University Press, Cambridge, UK), 111–166.

Van Maanen J, Barley SR (1984) Occupational communities: Culture and control in organizations. *Res. Organ. Behav.* 6:287–365.

Walter J, Lechner C, Kellermanns FW (2016) Learning activities, exploration, and the performance of strategic initiatives. *J. Management* 42(3):769–802.

Wang G, Oh I-S, Courtright SH, Colbert AE (2011) Transformational leadership and performance across criteria and levels: A meta-analytical review of 25 years of research. *Group Organ. Management* 36(2):223–270.

Williams LJ, Cote JA, Buckley MR (1989) Lack of method variance in self-reported affect and perceptions at work: Reality or artifact? *J. Appl. Psych.* 74(3):462–468.

Markus Kreutzer is a professor of strategic and international management at EBS University (Germany). He received his doctorate in strategic management from the University of St. Gallen. Prior to joining EBS, he worked as assistant professor of strategic management

at the Institute of Management at the University of St. Gallen and as visiting professor at the Entrepreneurship Department of IESE Business School. His research interests include interorganizational strategy-making, organizational control, renewal and adaptation, and business model innovation. He has published his research in the *Academy of Management Review, Strategic Management Journal, Long Range Planning*, among other journals. He serves on the editorial board of the *Journal of Management*.

Laura B. Cardinal is the SmartState Endowed Chair and Director for the Center for Innovation and Commercialization at the Darla Moore School of Business at the University of South Carolina. Previously, Laura was a faculty member at Tulane University, where she served as director of the Burkenroad Institute for the Study of Ethics and Leadership. Dr. Cardinal's expertise is mostly in the implementation of innovation goals and strategies, and includes the effects of organizational control and coordination on innovation, R&D, and new product development teams. She earned her PhD from the University of Texas at Austin where she was a National Science Foundation grant recipient. Dr. Cardinal sits on the Board of Governors of the Academy of Management (AOM). She is an associate editor of the *Academy of Management Annals*, and serves on the editorial boards of the *Academy of Management Journal*, *Academy of Management Discoveries*, and *Journal of Organization Design*. Prior to sitting on the AOM Board, she sat on the Board of Directors of the Strategic Management Society (SMS) and has served as chair

for the Competitive Strategy Interest Group of the SMS and for the Technology and Innovation Management Division of the AOM.

Jorge Walter is an associate professor and Ave Tucker Fellow at the School of Business, George Washington University. His research interests include strategy formation and implementation processes, knowledge/technology transfer, social networks, and social capital. His work has appeared, among others, in *Academy of Management Journal*, *Journal of Management*, *Journal of Management Studies*, *Organization Science*, *Personnel Psychology*, and *Strategic Management Journal*. Dr. Walter serves on the editorial board of the *Journal of Management*. Prior to entering academia, he worked in corporate finance and strategic management consulting.

Christoph Lechner is a chaired professor of strategic management at the University of St. Gallen. He has published extensively, including in *Academy of Management Journal, Journal of Management, Journal of Management Studies, Long Range Planning, MIT Sloan Management Review, Wall Street Journal*, among others. He has served as a member of the Editorial Boards of the *Strategic Management Journal, Journal of Management Studies, Long Range Planning*, and *Journal of Strategy & Management*. He co-authored papers that won the 2005 SMS Best Conference Paper Prize and the 2006 Sumantra Ghoshal Research and Practice Award at the Academy of Management. He has led executive education programs for leading companies in the U.S., Europe, and Asia.